

Final
Environmental Assessment



**Construction and Operation
Water Treatment Building
Cavalier Air Force Station
North Dakota**

July 2010

Report Documentation Page		Form Approved OMB No. 0704-0188
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.		
1. REPORT DATE JUL 2010	2. REPORT TYPE	3. DATES COVERED 00-00-2010 to 00-00-2010
4. TITLE AND SUBTITLE Final Environmental Assessment for Construction and Operation of a Water Treatment Building at Cavalier Air Force Station, North Dakota		5a. CONTRACT NUMBER
		5b. GRANT NUMBER
		5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER	
	5e. TASK NUMBER	
	5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) 21st Civil Engineer Squadron (CES/CEANN),580 Goodfellow Street,Peterson AFB,CO,80914		8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited		
13. SUPPLEMENTARY NOTES		
14. ABSTRACT <p>This EA has been prepared in accordance with the National Environmental Policy Act of 1969, as amended, and analyzes impacts from construction and operation of a Water Treatment Building. Sulfuric acid and other chemicals are currently stored in the Power Plant which presents risks with the transport and usage of these chemicals. The Proposed Action is to construct a separate building for storage and use of these hazardous materials/chemicals. Following is a summary of the resources assessed and the potential impacts. The analysis looked at air quality but given the small area of the proposed site, minimal number of worker vehicles anticipated short duration of the construction, wind dispersal of the volatile organic chemicals emitted, and implementation of dust control measures, the potential direct impacts to air quality would be temporary and negligible. Impacts to geological resources would not be significant given the small construction area and the use of best management practices. Groundwater and surface water impacts would not be significant and a National Pollutant Discharge Elimination System permit would not be required. The project area does not include optimal habitat for any Federal or state listed species and the area has been previously disturbed so no significant biological impacts were identified. Previous surveys did not identify any cultural resources in the project area. No new hazardous materials would be introduced and removing the chemicals from the Power Plant and relocating them to a dedicated building was found to be beneficial to health and safety of personnel. No environmental justice impacts were identified. Overall no significant impacts were identified and a Finding of No Significant Impact was prepared.</p>		
15. SUBJECT TERMS		

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 58	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

FINDING OF NO SIGNIFICANT IMPACT
Construction and Operation of Water Treatment Building
Cavalier Air Force Station, North Dakota

This Finding of No Significant Impact (FONSI) is prepared for Construction and Operation of the Water Treatment Building at Cavalier Air Force Station, North Dakota.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The United States Air Force (USAF) is proposing to construct a Water Treatment Building to store sulfuric acid and other chemicals. The sulfuric acid and other chemicals are currently stored in the Power Plant Building which presents risks to the health and safety of personnel and issues with the transport and usage of these materials.

The Water Treatment Building would be located southwest of the Perimeter Acquisition Radar Characterization System (PARCS) Power Plant and to the northeast of the cooling towers. The proposed site is in a previously cleared and developed area within the fenced PARCS area. The proposed building would be a pre-engineered steel building approximately 20 feet by 30 feet in size. The building would be constructed in accordance with Air Force regulations for storing chemicals and include the required safety measures such as an eye wash station, leak detection and/or alarms, fire alarm system, and telephone. Site work would include excavation and backfill and laying pavement for a concrete slab. The foundation footings would be dug six to eight feet deep. A new electrical underground supply would be installed next to the existing water lines. The slab foundation would be constructed to meet local design/load conditions. The concrete floor would be treated to resist acid and an acid tank, one acid metering pump, four chemical metering pumps and secondary containment would be included. The No Action Alternative was also analyzed in the EA.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The following paragraphs summarize the impacts that would likely occur from implementing the Proposed Action.

Air Resources: Given the small area of the proposed site, minimal number of worker vehicles, anticipated short duration of the construction, wind dispersal of the volatile organic chemicals emitted, and implementation of dust control measures, the potential direct impacts to air quality would be temporary and negligible.

Geological Resources: Given the small construction area and the use of best management practices impacts to geology, topography and soils would not be significant. There are no major faults in the vicinity of Cavalier AFS; therefore, impacts to seismicity would not be significant. Impacts to topography would not be significant.

Water Resources: There would be no increase in personnel or water use associated with the Proposed Action, and long-term impacts to the aquifers would not be significant. Since the project would disturb less than one acre a National Pollutant Discharge Elimination System permit would not be required.

Biological Resources: Excavation of soils and vegetative cover in order to construct the Water Treatment Building and underground electrical supply would not require the disruption of important habitat or previously undisturbed land. Once the construction is complete, the open area around the Building and new underground electrical supply would be landscaped with native vegetation. The installation would continue to spray the area for noxious weeds annually and on an as needed basis. As long as noxious weeds are controlled, they would not have an impact on the project area. Wildlife such as mice and ground squirrels would be displaced as part of the action. Impacts to these species are not considered significant due to the mobility of these species to seek similar habitat in the surrounding area. Procedures are in place to protect nesting birds, no significant impacts are expected.

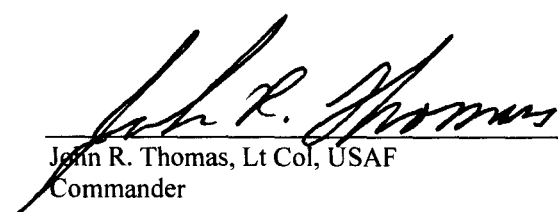
Cultural Resources: No known cultural resources have been identified in the area proposed for construction of the Water Treatment Building. This area has been previously disturbed due to past installation operations; therefore, digging at this location is not anticipated to unearth any cultural resources. The three structures eligible for the National Register of Historic Places would not be impacted by the Proposed Action. There would be no known impacts to cultural resources from activities associated with the Proposed Action.

Environmental Justice: There would be no disproportionate impacts to minority populations or low-income populations or children from constructing or operating the Water Treatment Building.

Hazardous Materials: The overall use of chemicals and hazardous materials would not increase as a result of constructing and operating the Water Treatment Building. Removing the chemicals from the Power Plant and away from Power Plant personnel and relocating them to a dedicated building would be beneficial to the health and safety of personnel.

CONCLUSION

Pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969 (42 United States Code 4321-4347), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 Code of Federal Regulations [CFR] 1500-1508), and the Department of the Air Force Environmental Impact Analysis Process (32 CFR 989), the Air Force analyzed the potential environmental effects of the Proposed Action and alternatives in the attached Environmental Assessment (EA). Based on the findings of the EA, I conclude that the environmental effects are not significant and the preparation of an Environmental Impact Statement is not warranted.


John R. Thomas, Lt Col, USAF
Commander

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Date

COVER SHEET

Agency: U.S. Air Force

Title: Environmental Assessment (EA) for Construction and Operation of a Water Treatment Building at Cavalier Air Force Station, North Dakota

Date: July 2010

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Designation: Final EA

Contract: AMEC Contract Number: FA8903-08-D-8766, Task Order: 0003

Abstract: This EA has been prepared in accordance with the *National Environmental Policy Act* of 1969, as amended, and analyzes impacts from construction and operation of a Water Treatment Building. Sulfuric acid and other chemicals are currently stored in the Power Plant which presents risks with the transport and usage of these chemicals. The Proposed Action is to construct a separate building for storage and use of these hazardous materials/chemicals. Following is a summary of the resources assessed and the potential impacts. The analysis looked at air quality but given the small area of the proposed site, minimal number of worker vehicles, anticipated short duration of the construction, wind dispersal of the volatile organic chemicals emitted, and implementation of dust control measures, the potential direct impacts to air quality would be temporary and negligible. Impacts to geological resources would not be significant given the small construction area and the use of best management practices. Groundwater and surface water impacts would not be significant and a National Pollutant Discharge Elimination System permit would not be required. The project area does not include optimal habitat for any Federal or state listed species and the area has been previously disturbed so no significant biological impacts were identified. Previous surveys did not identify any cultural resources in the project area. No new hazardous materials would be introduced and removing the chemicals from the Power Plant and relocating them to a dedicated building was found to be beneficial to health and safety of personnel. No environmental justice impacts were identified. Overall no significant impacts were identified and a Finding of No Significant Impact was prepared.

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ACRONYMS/ABBREVIATIONS

AAM	Annual arithmetic mean
ABM	Antiballistic Missile
AFB	Air Force Base
AFCEE	Air Force Center for Engineering and Environment
AFI	Air Force Instruction
AFS	Air Force Station
AFSPC	Air Force Space Command
BLDG	Building
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon monoxide
CWA	Clean Water Act
DoD	Department of Defense
EA	Environmental Assessment
EBS	Environmental Baseline Survey
EO	Executive Order
EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Environmental Restoration Program
FONSI	Finding of No Significant Impact
H ₂ S	Hydrogen sulfide
HAP	Hazardous air pollutants
HAZMAT	Hazardous materials
HMMP	Hazardous Materials Management Plan
Mg/L	Milligrams per liter
MBTA	Migratory Bird Treaty Act
MSS	Mission Support Squadron
NAAQS	National Ambient Air Quality Standards
ND	North Dakota
NDAAQS	North Dakota Ambient Air Quality Standards
NDDH	North Dakota Department of Health
NEPA	National Environmental Policy Act
NO ₂	Nitrogen dioxide
NO _x	Nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places

O ₃	Ozone
PAH	Polynuclear aromatic hydrocarbons
PARCS	Perimeter Acquisition Radar Characterization System
Pb	Lead
PM ₁₀	Particulate matter 10 microns in diameter
PM _{2.5}	Particulate matter 2.5 microns in diameter
PPM	Parts per million
PSD	Prevention of Significant Deterioration
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO ₂	Sulfur dioxide
SO _x	Sulfur oxides
SPCC	Spill Prevention, Control, and Countermeasures
SRMSC	Stanley R. Mickelsen Safeguard Complex
SWS	Space Warning Squadron
TPY	Tons per year
TDS	Total dissolved solids
TSP	Total suspended particulates
µg/m ³	Micrograms per cubic meter
USAF	United States Air Force
USBC	United States Bureau of Census
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	Volatile organic compounds

1 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

This environmental assessment (EA) evaluates the potential for environmental consequences from construction and operation of a Water Treatment Building at Cavalier Air Force Station (AFS), North Dakota (ND). Construction of this building would provide a safe environment for chemical storage and use.

This EA presents the Purpose and Need for the Action (Section 1), Description of the Alternatives Including the Proposed Action (Section 2), Affected Environment (Section 3), Environmental Consequences (Section 4), References (Section 5), List of Preparers (Section 6) and Appendices. This Section provides an introduction, lists the Federal environmental requirements, describes the purpose and need for the project, and the public review process.

1.1.1 Location

Cavalier AFS occupies 278 acres approximately 14 miles west of Cavalier, North Dakota, in Pembina County. Cavalier AFS is located approximately 15 miles south of the Canadian border, 45 miles west of the Minnesota border, and 67 air miles north-northwest of Grand Forks, ND. Access to Cavalier AFS is by ND State Highway 89 which intersects with ND State Highway 5 two miles north of the Cavalier AFS main gate. Figure 1 shows the general location of the AFS.

1.1.2 Mission

Cavalier Air Force Station is operated by the 10th Space Warning Squadron (10 SWS), 21st Space Wing, Air Force Space Command (AFSPC). The facility was constructed by the U.S. Army Corps of Engineers in the early 1970s as one component of the SAFEGUARD Antiballistic Missile (ABM) System. In 1977, after the ABM system was decommissioned, the U.S. Air Force (USAF) began to operate the facility with an Air Force mission.

The 10 SWS operates Cavalier AFS with support from several civilian contractor organizations and the 319th Mission Support Squadron (MSS) located at Grand Forks Air Force Base (AFB), North Dakota. Support from the host base is governed by the Host Tenant Support Agreement and primarily involves supplies, small construction and service contracting services, civil engineering, security police forces, and administrative support for the military and Department of Defense (DoD) civilians who are assigned at Cavalier AFS.

Approximately 32 military, 6 DoD civilians, and 120 contractor personnel are assigned to Cavalier AFS. Fourteen families, dependents of USAF personnel, live in the Military Family Housing units located at Cavalier AFS. Two dormitories also serve the military population. The total population of Cavalier AFS varies but is usually close to 150 people.

The main structure at Cavalier AFS is the Perimeter Acquisition Radar Characterization System (PARCS), housed in a hardened concrete structure. The entire facility is fenced with most site structures committed to mission activities. Fifty eight acres of the facility are under structures, roadways, and other improvements.

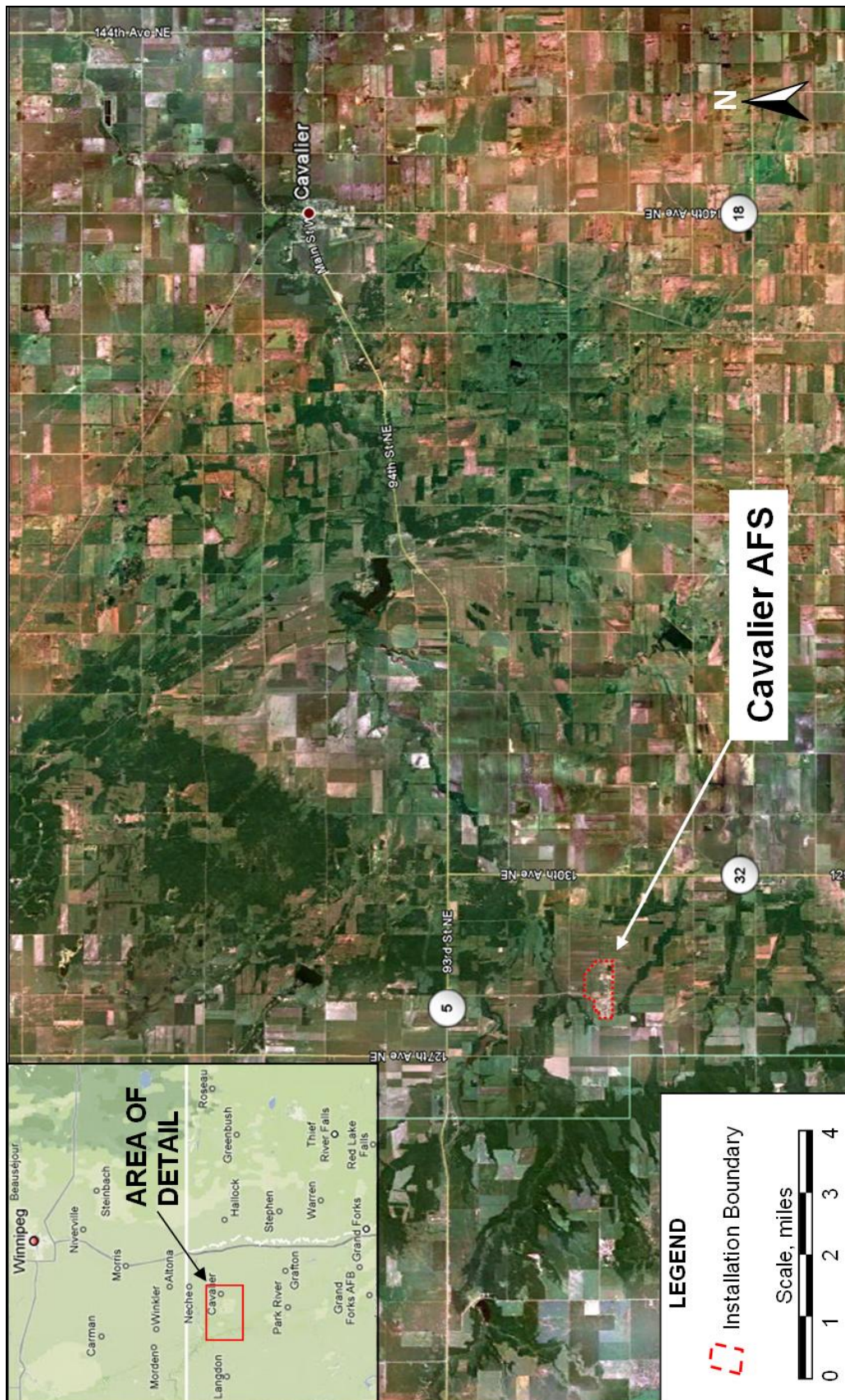


Figure 1. General Location of Cavalier AFS

The 10 SWS tactical mission is to detect and provide early warning of a ballistic missile attack of North America. Its collateral mission is to detect and monitor the behavior of satellites and space objects in the Earth's orbit.

Cavalier AFS is divided into two main areas:

- a controlled-access area for radar operations, related tactical support equipment, and most administrative offices.
- a non-controlled-access area with recreation areas, living quarters, law enforcement and fire department offices, facilities maintenance shop, transportation and motor pool, and the hazardous waste storage facility.

1.2 FEDERAL ENVIRONMENTAL REQUIREMENTS

The National Environmental Policy Act (NEPA) of 1969, as amended, requires Federal agencies to consider environmental consequences in their decision-making process. The President's Council on Environmental Quality (CEQ) issued regulations (40 Code of Federal Regulations [CFR] 1500-1508) to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis. The Air Force has prepared this EA through adherence to procedures set forth in the CEQ regulations (Title 40 CFR 1500 et seq.), and Air Force Instruction (AFI) 32-7061, as promulgated at 32 CFR Part 989 (Air Force Environmental Impact Analysis Process). These Federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation, designed to ensure deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. This EA will facilitate decision-makers in making environmentally informed decisions in support of implementing the proposed Water Treatment Building construction project.

1.3 PURPOSE AND NEED

The primary mission of Cavalier AFS is to operate a PARCS for the purpose of tracking objects in space. The PARCS building is a concrete structure that stands 130 feet tall and is 200 feet square at the base. Connected to the PARCS building is the Power Plant, Building 820. The Power Plant was constructed in 1974. The Power Plant is cooled by two cooling towers (Structures 00807 and 00809). Each cooling tower has a capacity of 7,000 gallons per minute. The two current cooling towers evaporate approximately 100,000 gallons of water per day, and the cooling water requires chemical treatment. Chemicals used to treat the cooling water include various biocides, corrosion inhibitors, sulfuric acid, water softener, and demineralizer. Currently, chemicals used to service the cooling water and descale cooling tower louvers are stored in the Power Plant building.

The purpose and need for constructing this Water Treatment Building is to provide a separate and safe environment for chemical storage and use. Constructing a separate facility for the water treatment would allow for separation of hazardous chemicals from personnel and reduce the existing safety hazard.

1.4 PUBLIC REVIEW PROCESS

An advertisement announcing the availability of the Draft Final EA and Finding of No Significant Impact (FONSI) for 30-day public review was published in the *Cavalier Chronicle* on June 9, 2010. A copy of the EA was also placed in the Cavalier Public Library and made available on the internet at www.bechtel--s.com/public. Appendix B contains a copy of the Affidavit of Publication. No public comments were received.

2 DESCRIPTION OF THE ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 INTRODUCTION

This section describes the Proposed Action and the No Action Alternative. The project description is based on engineering drawings, DD Form 1391, and additional information obtained during a kick-off teleconference held with 21st Space Wing personnel familiar with the proposed project.

2.2 DESCRIPTION OF THE PROPOSED ACTION

The Air Force is proposing to construct and operate a Water Treatment Building. As shown on Figure 2, the new facility would be located southwest of the PARCS Power Plant and to the northeast of the cooling towers. The proposed site is in a previously cleared and developed area within the fenced PARCS area.

The proposed building would be a pre-engineered steel building approximately 20 feet by 30 feet in size. Steel buildings resist extreme weather conditions like high-speed winds, heavy snowfall and earthquakes and structural maintenance costs are low. The likelihood of a fire destroying a steel building or spreading to other nearby buildings is very low as they are non-combustible. This makes steel storage buildings especially suitable for storing chemicals and other hazardous materials. The building would be constructed in accordance with Air Force regulations for storing chemicals and include the required safety measures such as an eye wash station, leak detection and/or alarms, fire alarm system, and telephone.

Site work would include excavation and backfill and laying pavement for a concrete slab. The foundation footings would be dug six to eight feet deep. A new electrical underground supply would be installed next to the existing water lines (see Figure 3). The slab foundation would be constructed to meet local design/load conditions. The concrete floor would be treated to resist acid and an acid tank, one acid metering pump, four chemical metering pumps and secondary containment would be included.

Table 1 shows the chemicals that are currently stored in the Power Plant and used for treating the cooling towers. These chemicals would be removed from the Power Plant and stored and mixed in the proposed Water Treatment Building.

2.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, acid, corrosion inhibitors, and biocides would continue to be used and stored in Building 820 (Power Plant). Safety risks with transporting and using these chemicals would continue.



Figure 2. Project Location

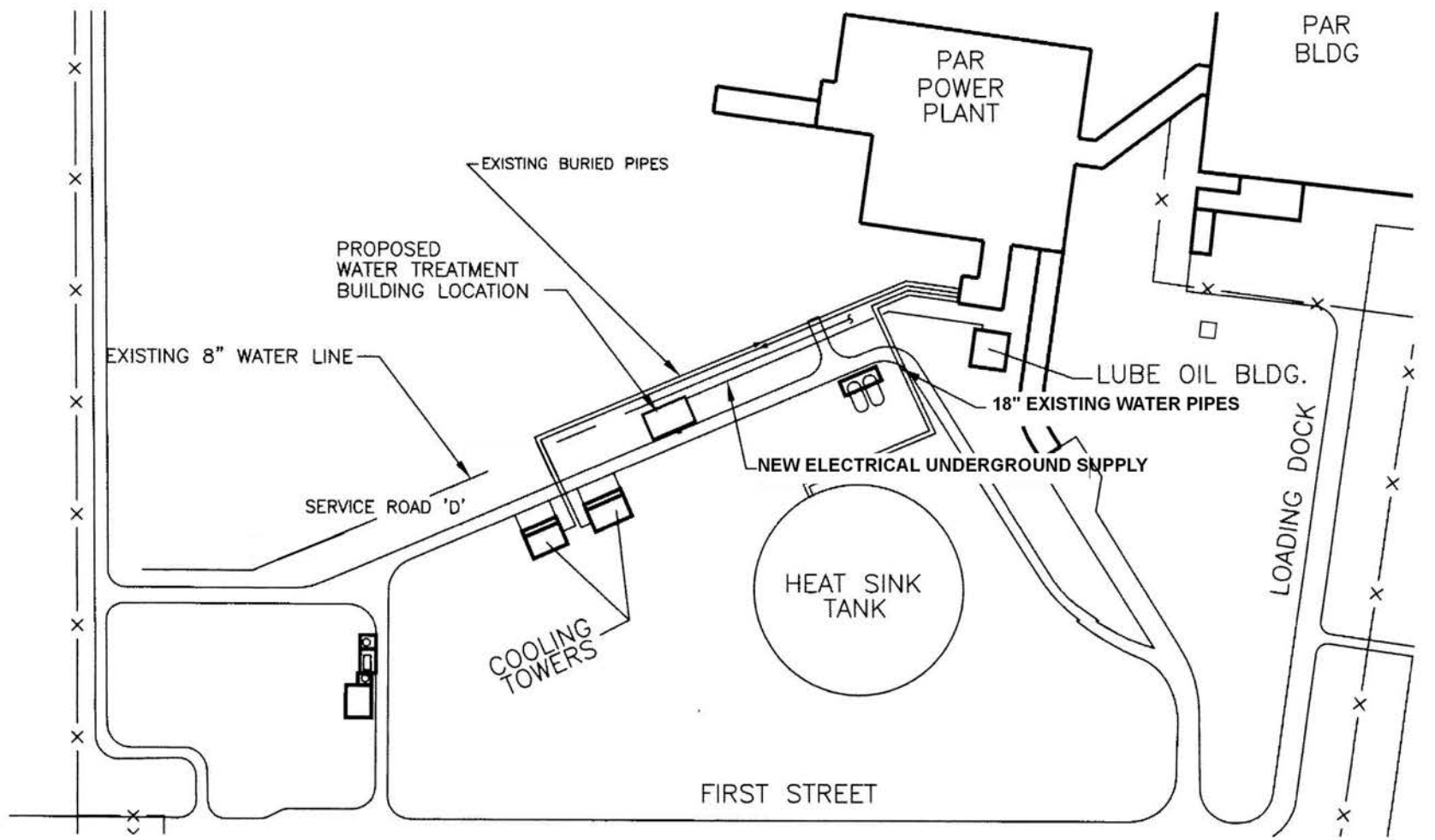


Figure 3. Location of Water Treatment System

Table 1.
Cooling Water Chemicals

Chemical (Ingredient)	Function	Estimated Quantity
95 percent sulfuric acid	pH control	2,500 gallons per year
Biosperse 255 (Glutaraldehyde)	Biocides	520 gallons per year
Biosperse 257 (Tris[hydroxyl-methyl]nitromethane, Formaldehyde)		
WRICO BGA Microbiocide (Phenol, 4-chlor-2(Phenylmethyl)-Potassium Salt, Potassium Hydroxide, Trade Secret)	Algaecide	52 gallons per year
Drewgard 2808 (Borax, Sodium Hydroxide, Sodium Nitrite, Trade Secret)	Corrosion and Scale Inhibitors	1,000 gallons total per year
Drewgard 11-760 (Phosphoric Acid, Sulfuric Acid, Sulfuric Acid-Zinc Salt, Trade Secret)		
Source: USAF, 2000b; USAF, 2010		

3 AFFECTED ENVIRONMENT

This Section describes the environment at Cavalier AFS (as appropriate), providing baseline information to allow the evaluation of potential environmental impacts that could result from the Proposed Action and the No Action Alternative. As stated in 40 CFR Sec. 1508.14, the human environment includes natural and physical resources and the relationship of people to those resources. The environmental baseline resource areas described in this section were selected after identifying the potential issues and concerns of the Water Treatment Building construction and operation. Only relevant resource areas are described. In accordance with 40 CFR Sec. 1502.15, the resource areas that would not be impacted are not carried forward for further analysis. These resource areas are listed below, with a brief explanation for their omission from the analysis.

- **Transportation.** Transportation will not be addressed since traffic volume on the Installation is low and there is no appreciable congestion during peak traffic periods. The additional worker vehicles and construction equipment associated with the construction, delivery of materials, or occasional routine maintenance would not result in any noticeable change to the Installation's entry gate or roads.
- **Noise.** Noise levels around military installations result primarily from aircraft operations. Because Cavalier AFS does not have an active runway and there are no sensitive receptors (e.g., chapel, hospital), noise levels will not be analyzed. Noise from construction activities would be short-term and limited to daylight hours. There would be no significant impacts to noise levels from construction of the Water Treatment Building.
- **Socioeconomics.** There would be slight, but beneficial increases in the local economy from construction of the water treatment building. The workers may be hired from the local area and no influxes of personnel or housing are anticipated. Therefore, population, local economy, and housing will not be discussed further in this EA.
- **Environmental Restoration Program (ERP).** The Defense Environmental Restoration Program was formally established by Congress in 1986 to provide for the cleanup of DoD property. The ERP requires each installation to identify, investigate, and clean up contaminated sites. All ERP sites at Cavalier AFS have been officially closed and are not within the proposed project area. These sites would not be disturbed as part of this action and therefore will not be discussed further in this EA.

A Phase II comprehensive site evaluation was conducted at the Trap Range. Surface soil samples collected in the area of clay target fragments indicated polynuclear aromatic hydrocarbons (PAH) levels above U.S. Environmental Protection Agency regional residential screening levels (USAF, 2009c). The Air Force plans to remove the fragments which would consist of about three inches of soil being removed in the areas where low levels of PAH were found and up to six inches of soil being removed in the areas where heavy levels of PAH were found. The Trap Range is not in the proposed project area; therefore, it would not be disturbed as part of the Proposed Action.

The resource areas that may be impacted by the Proposed or No Action Alternative include the physical environment (air quality, geology, soils, and water), the natural environment (vegetation

and wildlife), the human environment (cultural resources and environmental justice) and concludes with hazardous materials.

3.1 AIR RESOURCES

Air quality is characterized by the existing concentrations of various pollutants and the climatic and meteorological conditions that influence the quality of air. This section discusses the climate and meteorology of Cavalier AFS, air quality standards, and existing air pollutant sources.

3.1.1 Climate and Meteorology

The climate in northeastern North Dakota is typical of the northern Great Plains. Temperatures in the area are subject to large seasonal and yearly variations. Average temperatures range from approximately 2 degrees Fahrenheit in January to 68 degrees Fahrenheit in July. Generally, there are only 104 to 120 frost-free days each year. The cold and snowy weather period starts in November and continues through March. Summers are relatively mild. The predominant form of precipitation generally changes from snow to rain in April. The annual average precipitation at Cavalier AFS is approximately 19 inches per year. Precipitation monthly averages range from 0.38 inches in February to 3.15 inches in June. In general, the winds in the vicinity of Cavalier AFS are from the north in the winter and from the south in the summer, with an annual average wind speed of approximately 13.4 miles per hour. April and October are the windiest months, with average wind speeds of 15.6 and 14.5 miles per hour, respectively.

3.1.2 Air Quality Standards

The National Ambient Air Quality Standards (NAAQS), established by the United States Environmental Protection Agency (USEPA) define the maximum allowable concentrations of pollutants that may be reached but not exceeded within a given time period. These standards were selected to protect human health with a reasonable margin of safety. Section 110 of the Clean Air Act (CAA) requires states to develop air pollution regulations and control strategies to ensure that state air quality meets the NAAQS established by USEPA. These ambient standards are established under Section 109 of the CAA, and they currently address six criteria pollutants. These pollutants are: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), lead (Pb), particulate matter, and sulfur dioxide (SO₂). In addition to the six NAAQS, North Dakota also has standards for hydrogen sulfide (H₂S). Each state must submit these regulations and control strategies for approval and incorporation into the Federally enforceable State Implementation Plan (SIP). Exceeding the concentration levels within a given time period is a violation, and constitutes a non-attainment of the pollutant standard.

North Dakota has adopted a more stringent set of standards, termed the North Dakota Ambient Air Quality Standards (NDAAQS). Emissions of air pollutants from operations in North Dakota are limited to the more restrictive Federal or state standard. Particulate matter has been further defined by size. There are standards for particulate matter smaller than 10 microns in diameter (PM₁₀) and smaller than 2.5 microns in diameter (PM_{2.5}). Table 2 presents the current NAAQS and the NDAAQS for the six criteria pollutants.

Table 2.
National Ambient Air Quality Standards (NAAQS)
and North Dakota Ambient Air Quality Standards (NDAAQS)

Pollutant	Averaging Time	NAAQS µg/m ³ (ppm) ^a		NDAAQS µg/m ³ (ppm) ^a
		Primary ^b	Secondary ^c	
O ₃	1 hr	235 (0.12)	Same	None
	8 hr ^e	147 (0.075)	Same	Same
CO	1 hr	40,000 (35)	None	Same
	8 hr	10,000 (9)	None	Same
NO ₂	AAM ^d	100 (0.053)	Same	Same
	1 hr	0.100	None	None
SO ₂	1 hr	None	None	715 (0.273)
	3 hr	None	1,300 (0.5)	None
	24 hr	365 (0.14)	None	260 (0.099)
	AAM	80 (0.03)	None	60 (0.023)
PM ₁₀	AAM	None	None	None
	24 hour	150	Same	Same
PM _{2.5} ^e	AAM	15	Same	Same
	24 hr	35	Same	Same
Pb	¼ year	1.5	Same	Same
	3 months	0.15	Same	None
H ₂ S	1-hour	None	None	280 (0.20)
	24-hour	None	None	140 (0.10)
	3 months	None	None	28 (0.02)
	Maximum Instantaneous	None	None	14 mg ^f (10)

^aµg/m³ — micrograms per cubic meter; ppm — parts per million

^bNational Primary Standards establish the level of air quality necessary to protect the public health from any known or anticipated adverse effects of a pollutant, allowing a margin of safety to protect sensitive members of the population.

^cNational Secondary Standards establish the level of air quality necessary to protect the public welfare by preventing injury to agricultural crops and livestock, deterioration of materials and property, and adverse impacts on the environment.

^dAAM — Annual Arithmetic Mean.

^eOn June 5, 1998 EPA issued the final rule identifying areas where the one-hour national NAAQS for ozone is no longer applicable because there has been no current measured violation of the one-hour standard in such areas.

^fmg — milligrams per cubic meter

PM₁₀ is particulate matter equal to or less than 10 microns in diameter

PM_{2.5} is particulate matter equal to or less than 2.5 microns in diameter

Source: 40 CFR 50, North Dakota Air Pollution Control Regulations – NDAC 33-15

<http://www.epa.gov/air/criteria.html>; <http://www.ndhealth.gov/AQ/AirRules.htm>

Generally, criteria pollutants directly originate from mobile and stationary sources. Tropospheric O₃ is an exception, since it is rarely directly emitted from sources. Most O₃ forms as a result of volatile organic compounds (VOC) and nitrogen oxides (NO_x) reacting with sunlight.

All areas of the country are classified as attainment, nonattainment, or unclassifiable. Areas which meet the national primary and secondary ambient air quality standards are classified as attainment. Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for any criteria pollutant is designated as nonattainment. The entire North Dakota Air Quality Control Region (including Pembina County) is in attainment status for all criteria pollutants.

Prevention of significant deterioration (PSD) regulations (40 CFR Section 52.21) define air quality levels that cannot be exceeded by major stationary emission sources in specified geographic areas. Major stationary sources are usually sources that emit more than 100 tons per year (tpy) of a specific pollutant. PSD regulations establish limits on the amounts of SO₂ and total suspended particulates (TSP) that may be emitted above a premeasured amount in each of the three class areas. Class I areas are pristine areas, and include national parks and wilderness areas. All other areas in the United States are Class II areas, where moderate, well-controlled industrial growth could be permitted. There are no Class I areas located in the vicinity of Cavalier AFS. Cavalier AFS is located in a PSD Class II area.

3.1.3 Air Pollutant Sources

Air pollutants include the six criteria pollutants discussed previously. Particulate matter (PM₁₀ and PM_{2.5}) is generated during ground disturbing activities and during combustion. The principal source of CO and SO₂ is combustion. The precursors of O₃ (VOC and NO₂) are also primarily emitted from combustion. Hazardous air pollutants (HAP) include a wide range of materials or chemicals that are toxic or potentially harmful to human health. While HAPs are found in numerous products and used in many processes, few types and small amounts of HAPs are generated during internal combustion processes or earthmoving activities.

An Air Quality Monitoring Report (NDDH, 2008) did not identify any reportable levels of HAPs for Cavalier AFS. There were no NO₂, O₃, or PM exceedances of either the state or Federal ambient air quality standards measured during the year. Emissions in 2008 were below limits in the permit. Cavalier AFS is a major stationary source, as emissions of criteria pollutants are above 100 tpy and the potential to emit for any criteria pollutant is more than 250 tpy.

Air emissions at Cavalier AFS include those from stationary sources (i.e., boilers, petroleum storage tanks, and emergency generators) and mobile sources (i.e., vehicles, facilities, and grounds operations). Cavalier AFS currently has a Title V operating permit (Permit Number T5-089001) issued by the NDDH that expires on January 22, 2012 (NDDH, 2007).

3.2 GEOLOGICAL RESOURCES

3.2.1 Geology and Topography

Cavalier AFS is situated within the Western Lake Section of the Central Lowlands physiographic province and in the Red River Valley district. The Red River Valley is bordered by the Pembina

Escarpment that more or less trends north-south approximately 35 miles west of the Minnesota-North Dakota State Line. Its physical subdivision is within the eastern margin of North Dakota forming a strip 35 to 50 miles wide trending north-south. The valley is a flat, nearly featureless lake plain that has undergone very little erosion (USAF, 2000a). The Pembina Escarpment rises abruptly 500 to 700 feet above the valley bottom forming (in conjunction with the Pembina delta) the Pembina Mountains. Elevations on the AFS range from 1,130 feet above mean sea level in the eastern portion to 1,180 feet in the western part. The regional gradient is to the northeast, away from the Pembina Escarpment, which lies about one mile to the west of the AFS (USAF, 2000b; USGS, 1964).

The surface geology of the region is strongly influenced by glacial Lake Agassiz that formed when the north-flowing Red River was dammed by the retreating glacier in the Red River Valley. Cavalier AFS is located within a region of sand and gravel deposits that were formed in nearshore and offshore environments of Lake Agassiz. Wave action was the dominant factor producing the landforms of this area. Sand and gravel were reworked in this near-shore area and were deposited as vast beaches. This area is gentle and rolling with a nearly flat to gently undulating surface (USAF, 2009a).

A test bore was drilled at Cavalier AFS in May 1999 to determine the properties of geologic layers at the installation. Clayey to silty sand with a little gravel was encountered to a depth of 18 feet (USAF, 1999b). Very hard shale of the Pierre and Carlisle Formations underlies the clayey sand to the bottom of the borehole (at a depth of 187 feet).

There are no major faults in northeastern North Dakota. The entire state is included within Seismic Zone 0 on the seismic probability map of the United States (USAF, 2000a). Zone 0 is an area where earthquakes do not occur, but major distant earthquakes could produce slight damage. There are no specific seismic design requirements for Zone 0 (USAF, 1992).

3.2.2 Soils

Soils on Cavalier AFS consist of three soil series – Brantford loam, Binford sandy loam, and Vang loam. These series are well drained and formed in sand, silt, and gravel (USDA, 1977; 2010). The Brantford loam occurs only along an unnamed intermittent tributary of Tongue River and is not in the area potentially impacted by the Proposed Action. Properties of Binford and Vang soils are shown in Table 3. Soils in the proposed project area are Binford sandy loam with one to three percent slopes. This soil consists of sandy loam to a depth of 12 inches and gravelly sand to a depth of 60 inches. This soil is underlain by sand and gravel. Permeability is moderately rapid to rapid. Runoff is very slow and the hazard of wind erosion is high. The Binford sandy loam is difficult to revegetate due to droughty conditions (USDA, 1977; 2010). Figure 4 shows the soils in the project area. None of the soils on Cavalier AFS are listed as hydric soils (a potential indicator of wetlands).

3.3 WATER RESOURCES

Water resources discussed in this document include groundwater and surface water.

Table 3.
Cavalier AFS Soil Properties

Soil Series	Wind Ero- sion	Shrink-Swell ¹	Excavation	Piping	Compaction
Binford	high	low	severe – cutbanks cave	susceptible	fair-good
Vang	slight	low	severe – cutbanks cave	susceptible	poor-good
¹ Shrink-swell is the change in volume in a soil when soil moisture changes markedly (the tendency to swell when wet and shrink when dry). Sources: USDA, 1977; 2010					

3.3.1 Groundwater

Two types of aquifers provide groundwater in northeastern North Dakota—bedrock aquifers and glacial drift aquifers. There are three major aquifers located in the vicinity of Cavalier AFS. The Dakota Aquifer is the major bedrock aquifer while the Icelandic Aquifer is the largest glacial-drift aquifer. The Pembina Delta Aquifer is underlain by shale bedrock and by glacial till and thick deposits of lake clay and silt. Small aquifers within the Niobrara Formation and in Lake Agassiz beach deposits are also a source of groundwater.

The Dakota Aquifer underlies all of North Dakota, except parts of the Red River Valley. The western half of Pembina County is underlain by the Dakota Aquifer. This aquifer is located in the Dakota Group (shale and sandstone), generally from about 175 feet to 300 feet below the surface in western Pembina County, and is composed of quartzose, sandstone, and shale. The Dakota Aquifer is overlain and confined by the Greenhorn and Belle Fourche Formations (both composed of shale). Recharge of the Dakota Aquifer is to the west of the installation. Water from the Dakota Aquifer is generally not used because it is moderately saline, with greater than 5,000 milligrams per liter (mg/L) total dissolved solids (TDS), primarily sodium chloride and iron (USGS, 1977).

The Niobrara Aquifer yields small to moderately large quantities of water in large interconnected joints and fractures in shale. Well depths in this aquifer in the vicinity of Cavalier AFS range from 35 to 45 feet below the surface (NDSWC, 2010). Water quality is generally good, with TDS ranging from 390 to 2,500 mg/L, primarily sodium bicarbonate (USGS, 1977). Recharge is generally from overlying glacial drift aquifers.

The Carlile Formation is a potential source of limited amounts of water. The water is highly mineralized with poor water quality.

Two shallow glacial drift aquifers are near Cavalier AFS – the Icelandic Aquifer and the Pembina Delta Aquifer. The Icelandic Aquifer is more than 20 miles long, as much as 9 miles wide, and underlies about 82 square miles. The aquifer consists mostly of very fine to medium sand and gravel interbedded with silt and clay. The aquifer is unconfined at the top and underlain by clay but generally becomes finer grained with increasing depth from west to east. To the east of Cavalier AFS, the aquifer is saturated from 8 to 35 feet below the surface on average, and is approximately 15 to 30 feet thick. This aquifer has a maximum thickness of 70 feet. Recharge is mainly from precipitation that is received on the surface of the aquifer. Water from this aquifer is

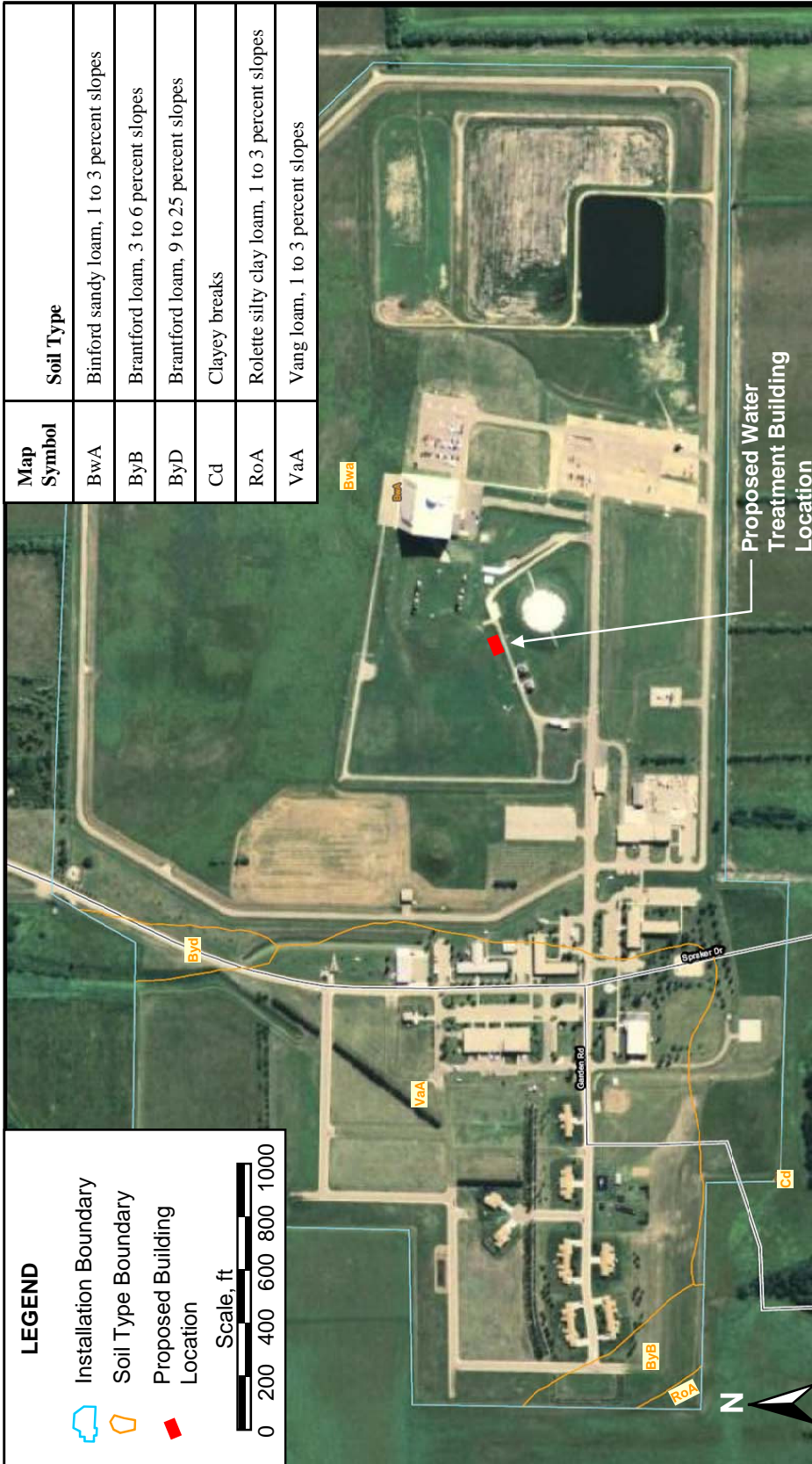


Figure 4. Soil Properties in Project Area

predominantly very hard (TDS is about 250 mg/L), fresh, and a calcium magnesium bicarbonate type that is acceptable for most domestic and public uses (USGS, 1977). The Icelandic Aquifer is about three miles east of Cavalier AFS and is a source of water for domestic use and irrigation.

Groundwater movement through the aquifer is generally from west to east. The Pembina Delta Aquifer is about 71 square miles in area and consists of clay, silt, sand, and gravel. To the north of Cavalier AFS, the aquifer is saturated from 4 to 31 feet below the surface on average, and is approximately 27 feet thick. Recharge to the Pembina Delta Aquifer is mainly from precipitation that is received in the immediate area; however, precipitation must percolate through several tens of feet of sediment before reaching the water table in much of the area. Groundwater in the Pembina Delta Aquifer is considered very hard (TDS is about 340 mg/L), with a high dissolved calcium and magnesium content. Iron in the groundwater often exceeds drinking water standards. The Pembina Delta Aquifer is tapped in the Cavalier region for livestock, irrigation, and some domestic use (USGS, 1977). This aquifer is about 1.5 miles north of Cavalier AFS. Groundwater movement through the aquifer is generally from west to east.

Lake Agassiz beach deposits, in long, narrow deposits of sand and gravel, are a source of water in limited areas. These aquifers are usually about 10 feet thick and water quality is generally good. Recharge is from precipitation. The town of Mountain, about 2.5 miles southeast of Cavalier AFS, obtains their municipal water supply from two wells drilled into this aquifer. The wells are about 23 feet deep.

A borehole log from a well drilled about one half mile west of Cavalier AFS indicated a water depth of 13 feet (USGS, 1973), in an unconfined lake deposit aquifer. A borehole near the site of the PARCS Building (Bldg 830) completed for a Geothermal Feasibility Study indicated a water depth of 7.6 feet (USAF, 1999b). This well was drilled into an unconfined aquifer in sand, overlain by silty sand and clayey sand.

Cavalier AFS purchases water from the North Valley Water Association. The water is derived from wells in the Icelandic Aquifer. Overall, water quality in the shallow glacial drift and beach deposit aquifers is good. The water supply is constantly monitored for various contaminants to meet all regulatory requirements of the USEPA and NDDH.

3.3.2 Surface Water

Northeastern North Dakota lies in the Central Lowlands physiographic region, which is primarily drained by the Red River of the North. This river drains 48,000 square miles of the United States, including 29,900 square miles of North Dakota. The Red River of the North forms in southeastern North Dakota, where the Otter Tail and Bois de Sioux Rivers combine. The primary tributaries near Cavalier AFS are the Pembina, Park, and Tongue Rivers.

The tributaries to the Red River of the North drain a large area. The Park River starts in Cavalier County and drains 1,010 square miles. Its waters are used for stock watering, municipal supply, recreation, and irrigation. The Pembina River starts in the Turtle Mountains and enters the Red River of the North at Pembina. It drains 1,960 miles in North Dakota and is used for stock watering, municipal supply, and recreation. The Tongue River is located about one-half mile north of Cavalier AFS and flows northeast, draining into the Pembina River. Although 59 percent of rivers in the Red River Basin fully supports aquatic life, the Tongue River only partially supports

aquatic life. This is primarily due to siltation from soil erosion (NDDH, 2010). Runoff from much of Cavalier AFS flows south, off of the installation, into Willow Creek, a tributary of the Park River, which travels southeast from the installation and empties into the Red River. Some runoff from the northern and western parts of the installation drains into a small intermittent stream (heading about 300 feet northwest of the project area) which flows north into the Tongue River (USAF, 2000d). Figure 5 shows some of the major tributaries in the area.

The North Dakota Department of Health & Environmental Division of Water Quality is responsible for administering the state's National Pollution Discharge Elimination System (NPDES) stormwater management program. North Dakota's stormwater program is closely modeled after the federal NPDES program, which requires stormwater be treated to the maximum extent practicable. At the state level, all construction sites disturbing more than one acre are required to obtain and meet the requirements of NPDES permit coverage.

3.4 BIOLOGICAL RESOURCES

Biological resources include the native and introduced plants and animals that make up natural communities. The natural communities are closely linked to the climate and topography of the area. There are no wetlands present on Cavalier AFS (USAF, 2009a). There are no known state or federally threatened or endangered species on Cavalier AFS (USAF, 2009a). Biological resources discussed below include wildlife and vegetation.

3.4.1 Wildlife

Wildlife species observed on Cavalier AFS during the 1996 biological survey include the great blue heron (*Ardea herodias*), horned lark (*Eremophila alpestris*), eastern mourning dove (*Zenaidura macroura*), moose (*Alces alces*), deer mice (*Peromyscus maniculatus*), and the Richardson ground squirrel (*Spermophilus richardsonii*).

Most birds are protected by the Migratory Bird Treaty Act (MBTA). The MBTA provides protection of nearly all species of birds from harm by prohibiting the destruction of active nesting habitat. Several species of ground-nesting birds have been observed on Cavalier AFS. As described in the Conservation Management Plan, procedures are in place to mark and protect these nests from disturbance when the nests are active.

3.4.2 Vegetation

Of the 278 land acres at Cavalier AFS, 90 acres are semi-improved grounds that are maintained to prevent erosion and control dust. Maintenance activities include mowing, fertilization, weed control, and plant disease control. Improved grounds total 15 acres and are limited to lawns around the family and unaccompanied personnel housing facilities, and other facilities. Maintenance activities include periodic mowing, water and fertilization, run-off, erosion and dust control, weed control, plant disease control, and tree and shrub maintenance. Unimproved grounds total approximately 115 acres and include management of grassland and the prevention and suppression of fires. Maintenance includes control of excessive or damaging dust, erosion, and poisonous and noxious weeds. The remaining 58 acres are covered by facilities and pavements (USAF, 2009a).

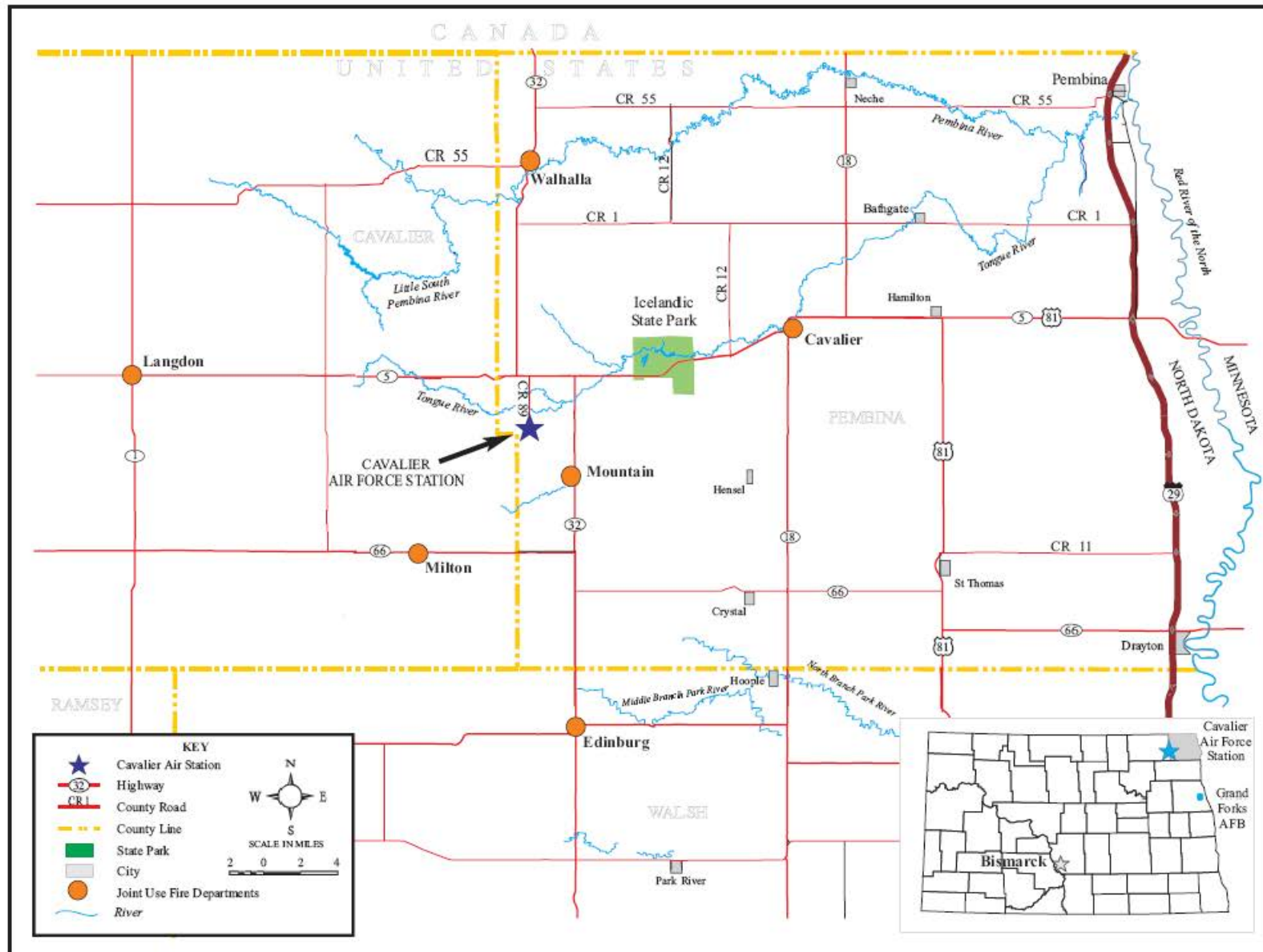


Figure 5. Surface Water Features

Cavalier AFS is currently naturalized grassland that was cleared and seeded with non-native grasses during its construction. Prior to construction of Cavalier AFS the land was cropland. The Proposed Action site is an open grassy area that is regularly mowed. There are no trees or shrubs on the site. Grass species currently at the installation include June grass, quack grass, and some Kentucky bluegrass (USAF, 2009a). Tree species include aspen, burr oak, and other woody deciduous species.

The North Dakota Department of Agriculture, Noxious Weeds Division, develops and coordinates integrated weed management programs in the state. Weeds declared noxious are weeds that are difficult to control, easily spread, and are injurious to public health, crops, livestock, land, and other property (North Dakota Century Code, Chapter 63-01.1). Noxious weeds that have been identified at Cavalier AFS are Canada thistle, leafy spurge, musk thistle, false chamomile, and perennial sow thistle. The installation actively manages noxious weeds on site. Weed management is conducted annually with primary emphasis during the spring and summer months.

3.5 CULTURAL RESOURCES

Cultural resources are archaeological, historical, and Native American items, places, or events considered important to a culture, community, tradition, religion, or science. Archaeological and historic resources are locations where human activity measurably altered the earth or left deposits of physical or biological remains. Prehistoric examples include arrowheads, rock scatterings, and village remains, whereas historic resources generally include campsites, roads, fences, homesteads, trails, and battlegrounds. Architectural examples of historic resources include bridges, buildings, canals, and other structures of historic or aesthetic value. Native American resources can include tribal burial grounds, habitations, religious ceremonial areas or instruments, or anything considered essential for the persistence of their traditional culture.

The Air Force conducted a cultural resources survey of Cavalier AFS in 1991 (USAF, 1999a). The survey did not identify any archaeological resources and concluded that disturbance from the construction of Cavalier AFS removed any possibility of finding historic or archaeological remains on the installation.

In 1970, construction at Cavalier AFS began as a site for the U.S. Army Safeguard missile defense program. The system became operational five years later. The original system was composed of a PARCS, the Missile Site Radar, and four Remote Sprint Launch sites. The PARCS (Bldg 830) is the only site located on Cavalier AFS. The Missile Site Radar is located in Nekoma. These six sites were designated the Stanley R. Mickelsen Safeguard Complex (SRMSC), protecting the northern United States and Canada from the “Cold War” Intercontinental Ballistic Missile threat. In 1976, with the ratification of the 1972 Anti-Ballistic Missile (ABM) Treaty, all components of the SRMSC, with the exception of the PARCS building, were deactivated. The SRMSC was the only operational ABM system ever deployed in the free world and is recognized as a significant influence in the negotiations of the ABM and Strategic Arms Limitation Treaty with the Soviet Union. The PARCS was designated the Concrete Missile Early Warning System in 1977. Since December 1983, the facility has been called “Cavalier Air Force Station” or “Cavalier Air Station”.

The Keeper of the National Register determined in 1998 that the entire PARCS/Cavalier AFS site was eligible for the National Register of Historic Places (NRHP) as an historic district, that 20 building or structures and an unknown number of “historic roads” were contributing elements of the historic district, and that 14 additional structures or buildings were non-contributing elements of the historic district. In 2008, AFSPC re-evaluated 33 of the 34 buildings and structures that had been addressed by the Keeper in 1998, and AFSPC determined that only three structures are eligible for the NRHP, the PARCS Building (Building 830), the Utility Tunnel (Building 825), and the Power Plant (Building 820). These two buildings and one structure are eligible under Criterion A for their significance in the historical context of the Cold War and under Criteria Consideration G for exceptional significance for properties less than 50 years old. The PARCS Building (Building 830) is also eligible under Criterion C for its unique architecture. All other buildings and structures are recommended as not eligible under NRHP Criteria. AFSPC has also determined that the boundaries of the historic district contain the two eligible buildings and one eligible structure, rather than the entire PARCS/Cavalier AFS site as previously determined by the Keeper (USAF, 2008). The State Historic Preservation Officer (SHPO) has concurred with the Air Force re-evaluation and concurs to leave only Buildings 820, 825, and 830 as eligible (State Historical Society, 2009). A Programmatic Agreement regarding management activities for the three eligible buildings has been signed by the Air Force and the SHPO and filed with the Advisory Council on Historic Preservation (USAF, 2009d).

3.6 HAZARDOUS MATERIALS

Hazardous materials are substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present a substantial danger to public health or the environment if released.

AFI 32-7086, *Hazardous Materials Management*, establishes procedures and standards that govern the management of hazardous materials throughout the USAF. It applies to all USAF personnel who authorize, procure, issue, use, or dispose of hazardous materials, and to those who manage, monitor, or track any of those activities. Under AFI 32-7086, the USAF has established roles, responsibilities, and requirements for a hazardous material management program (HMMP). The purpose of the HMMP is to control the procurement and use of hazardous material to support USAF missions, ensure the safety and health of personnel and surrounding communities, and minimize USAF dependence on hazardous materials. The HMMP includes the activities and infrastructure required for ongoing identification, management, tracking, and minimization of hazardous materials.

Cavalier AFS has numerous plans that address the management, spill containment, and cleanup of hazardous materials and petroleum products. The *Hazardous Materials (HAZMAT) Plan* (USAF, 2009b) provides policies and procedures for handling and storing hazardous materials at the installation. An integral part of the HMMP is the HAZMAT Pharmacy Program (USAF, 2009b). The HAZMAT Pharmacy is the single point of control and accountability over the requisitioning, receipt, distribution, issue and reissue of hazardous materials.

Cavalier AFS’s *Spill Prevention, Control, and Countermeasures (SPCC) Plan* lists the procedures to prevent, contain, and mitigate petroleum product spills (USAF, 2009b). The *Pollution Prevention Management Plan* (USAF, 2009b) provides procedures, requirements, and guidelines

for pollution prevention activities at Cavalier AFS, emphasizing sustained readiness and hazardous material minimization.

Hazardous materials used, stored, or otherwise handled at Cavalier AFS include sulfuric acid, nonrestricted use pesticides, bulk fuels, and engine lubrication oil. Minimal amounts of paints and other coatings are also used at the installation. Cavalier AFS utilizes underground storage tanks and above ground storage tanks for bulk storage of diesel fuel, gasoline, and engine and vehicle lubrication oils. Paints and other coatings, also controlled under the HMMP, are purchased in containers up to five gallons in size and stored indoors. Least toxic products are selected and applied as much as possible and all hazardous materials are purchased, stored, and used in accordance with the HMMP (USAF, 2009b).

Sulfuric acid is currently stored and used in the Power Plant (Bldg 820). Approximately 36,000 pounds are consumed annually (approximately 3,000 pounds most months) which is an amount greater than the reportable quantity and threshold planning quantities as specified by the Emergency Planning and Community Right-to-Know Act (EPCRA); therefore, spill response plans are in place in case of an incident. Spills or other incidents are most likely to occur when it is delivered by the vender and transported to the Power Plant. Spill team representatives and first responders are notified to be available prior to acid delivery and transport. Sulfuric acid is an extremely hazardous substance according to EPCRA Section 302. Sulfuric acid is purchased, stored, and used under the HMMP.

3.7 ENVIRONMENTAL JUSTICE

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was signed by the President on February 11, 1994. This EO requires that each federal agency identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. In order to evaluate these potential effects, demographic data on minority and low-income populations are provided in this section.

The terms “low-income” and “minority” are defined according to guidance published by the Air Force Center for Engineering and the Environment (AFCEE). Under this guidance, “low income” is defined as persons below the poverty level. The poverty threshold, which is a function of family size and is adjusted over time to account for inflation, was designated by the federal government as \$17,524 for a family of one adult and three children in 2000. “Minority” means persons designated in census data as Black (African-American); American Indian, Eskimo, or Aleut (Native American); Asian or Pacific Islander (now two separate designations in the 2000 Census); Other; or of Hispanic origin (AFCEE, 1997). The 1997 AFCEE Guidance did not address the new census category, “Two or more Races;” for this analysis, that category is also considered as a minority. According to the United States Bureau of Census (USBC) definition (USBC, 2010b), the Hispanic origin designation is separate from the ethnic (racial) designation, as “people who identify their origin as Spanish, Hispanic, or Latino may be of any race.” Within this document, to avoid confusion and eliminate double-counting, the Hispanic population is differentiated from ethnic (racial) minority populations. The environmental justice region of influence is defined by the residence patterns of existing personnel at the installation and for this EA is a portion of Pembina County within one mile of Cavalier AFS.

Environmental Justice also takes into consideration EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, which was signed by the President on April 21, 1997. This EO requires that each federal agency identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on children, who are more at risk because of developing body systems, comparatively higher consumption-to-weight ratios, behaviors that may expose them to more risks and hazards than adults, and less ability than adults to protect themselves from harm.

This section describes the minority and low-income characteristics of the project area and Pembina County. The descriptions are based on data from the 2000 *Census of Population and Housing*. Table 4 summarizes the proportions of ethnic, Hispanic, and low-income populations for the vicinity of the Proposed Action and Pembina County.

Table 4.
Census 2000 Characteristics:
Population Segment as a Percentage of the Total Population

	Census blocks in affected area (1)	Pembina County	ND
White (a)	100.0%	95.5%	92.4%
Black or African American (a)	0.0%	0.2%	0.6%
American Indian and Alaska Native (a)	0.0%	1.4%	4.9%
Asian (a)	0.0%	0.0%	0.6%
Native Hawaiian and Other Pacific Islander (a)	0.0%	0.0%	0.0%
Some other race (a)	0.0%	1.3%	0.4%
Two or more races	0.0%	1.4%	1.2%
Hispanic Origin (can be any race)	0.0%	3.1%	1.2%
Children (age 17 or less)	21.1%	24.9%	25.0%
Below poverty level (2)	7.0%	9.2%	11.9%
(a) Includes persons reporting only as one race. Population by race is from Census 2000 Summary File 1. (1) Census blocks off-base within one mile. (2) Values for the percent of persons below poverty level are from Census 2000 Summary File 3. Sources: USBC, 2010a, 2010b, 2010c			

The 2000 Census found that the population of Pembina County was 95.5 percent White. Notable other categories include American Indian (1.4 percent), while Other and Two or More Races accounted for 2.7 percent of the total. Hispanics comprise 3.1 percent of the county population.

North Dakota proportions are somewhat similar, but with a larger proportion of American Indians (4.9 percent). The State's Hispanic population accounts for about 1.2 percent of the total. In contrast, the U.S. population is approximately 25 percent minority, with Hispanics (12.5 percent) as the largest minority group, and Blacks representing 12.3 percent of total population. Less than 10 percent of the Pembina County population was below the poverty level, while about 12 percent of the state's population and 13 percent of the U.S. population was in this category.

The 2000 per capita income for Pembina County was \$18,692, which represents nearly 87 percent of the U.S. per capita income and 105 percent of North Dakota's per capita income (USBC, 2010a).

There are 19 off-base residents in census blocks within one mile of the project area. This population includes 19 whites. There are no Hispanics, and there are four children within this area (USBC, 2010a). The closest Census Designated Place is the town of Mountain, three miles to the southeast. The population of Mountain is 133, composed of 132 whites (99.2 percent) and 1 American Indian (0.8 percent) (122 residents as of July 2008). There are no urban areas in Pembina County, and the closest urban area (a population of 3,978 [2008 estimate]) is Grafton, about 30 miles southeast of Cavalier AFS.

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4 ENVIRONMENTAL CONSEQUENCES

This Section discusses the potential for significant impacts to the human environment as a result of implementing the Proposed Action or the No Action Alternative. As defined in 40 CFR 1508.14, the human environment is interpreted to include natural and physical resources, and the relationship of people with those resources. Accordingly, this analysis has focused on identifying types of impacts and analyzing their potential significance. This Section discusses the effects that the Proposed Action or the No Action Alternative could generate in the environmental resource areas previously described in Section 3.

The concept of “significance” used in this assessment includes consideration of both the context and the intensity or severity of the impact, as defined by 40 CFR 1508.27. Severity of an impact could be based on the magnitude of change, the likelihood of change, the potential for violation of laws or regulations, the context of the impact (both spatial and temporal), and the resilience of the resource. Significant impacts are effects that are most substantial and should receive the greatest attention in decision making. Impacts that are not significant result in little or no effect to the existing environment and cannot be easily detected. If a resource would not be affected by a proposed activity, a finding of no impact was declared. If a resource would be measurably improved by a proposed activity, a beneficial impact was noted.

This Section is organized by resource element in the same order as introduced in Section 3. Each resource section provides a discussion of the environmental impacts to that resource. Best management practices are included, if applicable. No mitigation measures were identified for any of the resource areas. The Section concludes with a discussion of the compatibility of the Proposed Action with objectives of federal, state, and local land use plans, policies, and controls, an evaluation of the relationships between short-term uses of the environment and long-term productivity, cumulative impacts, and irreversible and irretrievable commitments of resources.

4.1 AIR RESOURCES

The air analysis was based on a review of existing air quality in the region, information on Cavalier AFS air emission sources, projections of emissions from the proposed construction activities, and a review of Federal regulations and of the state regulations.

4.1.1 Potential Impacts of the Proposed Action

There would be increased emissions from the use of equipment and worker vehicles during the construction of the Water Treatment Building and new electrical underground supply. Construction equipment and worker vehicles would generate the most emissions, with CO, NO_x, and VOCs as the main constituents of exhaust, and earth-moving operations would generate fugitive dust (measured as PM₁₀).

Although construction-related emissions are generally exempt from Federal regulatory review, USEPA still requires that such activities not exceed the NAAQS. The types of equipment likely to be used include a crane and forklift to erect the building, bulldozers, dump trucks, backhoe/loaders, a water truck, and a roller to prepare the site. Site grading and excavation would generate most of the criteria pollutants. The entire project would last less than 90 days.

Air quality is considered good in the North Dakota Air Quality Control Region, which is in attainment for all criteria pollutants. The existing meteorological conditions would disperse pollutants generated by construction, and no air quality standards would be violated. The construction activities would have an unavoidable short-term impact on air quality. Construction activities would generate exhaust emissions from equipment and personal vehicles, and fugitive dust would be generated by earth-disturbing activities. Best management practices to reduce fugitive dust emissions, such as daily watering of the disturbed ground as needed and replacing ground cover in disturbed areas as quickly as possible, should be implemented to the maximum extent possible to reduce the amount of these emissions.

Given the small area of the proposed site, minimal number of worker vehicles, anticipated short duration of the construction, wind dispersal of the VOCs emitted, and implementation of dust control measures, the potential direct impacts to air quality would be temporary and negligible.

4.1.2 Potential Impacts of the No Action Alternative

If the Water Treatment Building and underground electrical supply are not constructed, air quality at the proposed site would remain unchanged.

4.2 GEOLOGICAL RESOURCES

The geological resources within the proposed project area were studied to determine the potential impacts from implementing the Proposed Action or No Action Alternative. Geological studies, a soil survey, previous EAs, and USGS topographical maps were reviewed to characterize the existing environment. Construction activities that could influence geological resources were evaluated to predict the type and magnitude of potential impacts. For example, soil would be disturbed during construction. The predicted post-construction environment was compared to the existing environment and the change was evaluated to determine if significant changes in any existing conditions would occur.

4.2.1 Potential Impacts of the Proposed Action

Site grading and excavation for the Water Treatment Building and underground electrical supply would impact the underlying geological layers to a depth of about eight to ten feet in an area of approximately 40 feet by 50 feet (2,000 square feet). The footing would be deep enough to avoid frost problems. As the site is excavated for the footings, soil would be temporarily stockpiled around the excavation. The soils in this area are sandy loam to a depth of five feet, underlain by gravely sand to a depth of five feet. The Binford soil is highly erodible by wind. Best management practices (such as daily watering as needed to control fugitive dust, properly installed site fences, maintaining existing vegetation as much as possible, and revegetating the project area as soon as possible) would be implemented to reduce the risk of erosion.

There are no major faults in the vicinity of Cavalier AFS; therefore, impacts to seismicity would not be significant. Impacts to topography would not be significant. During the construction process, excavations would likely reach to a depth of eight to ten feet. The site would be re-graded after the Building and underground electrical supply are constructed. This would not significantly affect the topography or drainage of the area.

Given the small construction area and the use of best management practices impacts to geology, topography and soils would not be significant.

4.2.2 Potential Impacts of the No Action Alternative

No impacts would occur to geological resources from the No Action Alternative.

4.3 WATER RESOURCES

To establish the potential impact of the Proposed Action documents on the hydrology and hydrogeology of the area were reviewed. Maps showing topography, watersheds, and Installation drainage were examined. The review focused on the proximity of the project area and construction activities to surface waters.

4.3.1 Potential Impacts of the Proposed Action

Groundwater

Potential impacts to groundwater could result by spills of diesel fuel or lubricants from construction equipment. The amount of any potential spill would be small and the extent that a spill could potentially travel would be limited by areas of silt and clay deposits, and by shale bedrock at a depth of about 13 feet. Groundwater movement is predominately to the east. A spill is unlikely to occur, but any potential spill would be diluted and filtered by silt and clay sediments to the east of Cavalier AFS. Any spills would be the responsibility of the construction contractor. Clean up would be in compliance with the SPCC Plan. The closest registered domestic and public water supply wells are about three miles north, east, and southeast from Cavalier AFS and would not be impacted by the Proposed Action. The Icelandic Aquifer, an important source of municipal, domestic, and agricultural water, would not be impacted by the Proposed Action due to its distance from Cavalier AFS (about three miles) and the silt and clay deposits between the aquifer and the AFS. Likewise, the Pembina Delta Aquifer (primarily a source of irrigation water) would not be impacted due to distance and the flow of the Tongue River toward the northeast about 0.5 miles north of Cavalier AFS. The Niobrara Aquifer could be impacted by potential spills during construction, but potential impacts would not be significant due to filtering by sandy and silty sediments and dispersion through groundwater. There are no registered wells in the Niobrara Aquifer within four miles of Cavalier AFS. The Dakota Aquifer, at a depth of 175 to 300 feet, would not be impacted due to nearly impermeable shale between the Niobrara Formation and the Dakota Group.

Small amounts of water would be used during construction for wetting disturbed areas and for mixing concrete, but these impacts would not be significant. There would be no long-term increase in personnel or water use associated with the Proposed Action, and long-term impacts to the aquifers would not be significant.

Surface Water

Construction activities could potentially impact local surface water. The construction could potentially increase turbidity of nearby surface water due to increased airborne dust and siltation from soil erosion. An intermittent stream, which flows to the Tongue River, heads about 300 feet

northwest of the project site. Any sediment entering this stream could impact the Tongue River. The use of standard best management practices would reduce the potential for erosion and sedimentation. Practices to reduce potential erosion include silt traps, chemical stabilizers, and watering of disturbed soil when dry to minimize dust. Since the project would disturb less than one acre a NPDES permit would not be required. Impacts to surface waters would not be significant.

4.3.2 Potential Impacts of the No Action Alternative

No impacts would occur to water resources from the No Action Alternative.

4.4 BIOLOGICAL RESOURCES

The assessment of potential impacts to biological resources focused on the proposed location for the Water Treatment Building and underground electrical supply. The existing habitat was evaluated. Documents reviewed included the Cavalier AFS Conservation Management Plan (USAF, 2009a) and past environmental documents and assessments.

4.4.1 Potential Impacts of the Proposed Action

Less than one half acre of vegetation (currently a grassy area maintained by mowing) would be disturbed to construct the Water Treatment Building and underground electrical supply. The loss of vegetation and temporary displacement of any wildlife during construction activities would be an unavoidable impact, but not significant. Vegetation would be reestablished after the construction is complete.

Excavation of soils and vegetative cover in order to construct the Water Treatment Building and underground electrical supply would not require the disruption of important habitat or previously undisturbed land. Once the construction is complete, the open area around the Building and new underground electrical supply would be landscaped with native vegetation. Other maintained grasses disturbed during digging and grading of the site would be replaced after construction activities are completed. The proposed site for the Water Treatment Building is in a grassy area that is not considered critical habitat.

Best management practices and control measures would be implemented to ensure that impacts to biological resources are kept to a minimum. The amount of vegetation disturbed during construction activities would be kept to the minimum amount required. Disturbed areas would be reestablished with native grasses. Additional measures proposed to minimize impacts could include using straw bales, silt fences, silt traps, or diversion structures and covering stockpiles during grading activities to contain waterborne erosion and reduce or prevent sediment from reaching storm sewers or ditches.

The installation would continue to spray the area for noxious weeds annually and on an as needed basis. As long as noxious weeds are controlled, they would not have an impact on the project area.

Wildlife such as mice and ground squirrels would be displaced as part of the action. Impacts to these species are not considered significant due to the mobility of these species to seek similar habitat in the surrounding area. Once the construction is complete, the contractor would be re-

quired to revegetate the open areas. The wildlife species previously displaced would readily return to the area. No long-term impacts to wildlife would occur. Procedures are in place to protect nesting birds, no significant impacts are expected.

Excavation, grading, and associated construction for the Proposed Action would occur on previously disturbed land within the built-up portion of the installation. This area does not include optimal habitat for any of the transient Federal- or state-listed species that may occur in Cavalier County. No threatened or endangered species are known to occur on Cavalier AFS, so no impacts to these species would occur.

4.4.2 Potential Impacts of the No Action Alternative

Under the No Action Alternative, there would be no change to the biological environment at Cavalier AFS.

4.5 CULTURAL RESOURCES

To determine potential impacts, the analysis focused on the types of construction activities that would occur and their location, and the significance of the resource in that location. The Integrated Cultural Resources Management Plan (USAF, 2008) and The Conservation Management Plan (USAF, 2009a) were reviewed to provide data on existing cultural resources on the installation.

4.5.1 Potential Impacts of the Proposed Action

No known cultural resources have been identified in the area proposed for construction of the Water Treatment Building. This area has been previously disturbed due to past installation operations; therefore, digging at this location is not anticipated to unearth any cultural resources. The three structures eligible for the NRHP would not be impacted by the Proposed Action. There would be no known impacts to cultural resources from activities associated with the Proposed Action.

Should unknown archaeological resources be uncovered during construction activities, the Air Force would follow procedures described in the Integrated Cultural Resources Management Plan for Cavalier AFS (USAF, 2008) and in AFI 32-7065, Cultural Resource Management, for coordination with the North Dakota State Historic Preservation Officer and Advisory Council on Historic Preservation.

4.5.2 Potential Impacts of the No Action Alternative

For the No Action Alternative, current conditions would not change and no impacts to cultural resources would occur.

4.6 HAZARDOUS MATERIALS

To assess potential impacts, the analysis focused on issues relating to hazardous materials. The analysis identified existing programs and the extent that construction and operation activities could affect a given program. Sources of information included the Final Environmental Baseline

Survey (EBS) for Privatization of the Military Family Housing, the DD Form 1391, and state and Federal laws and regulations.

4.6.1 Potential Impacts of the Proposed Action

The overall use of chemicals and hazardous materials would not increase as a result of constructing and operating the Water Treatment Building. Removing the chemicals from the Power Plant and away from Power Plant personnel and relocating them to a dedicated building would be beneficial to health and safety of personnel.

Hazardous materials would be used by the contractor during construction, but would be limited to fuels for equipment, and cleaning compounds for equipment and the facility. Standard materials would be used for construction and would not pose any unusual or substantial threat to human health or the environment. Standard safety procedures would be required (e.g., no smoking while fueling equipment). Overall, construction activities would minimally increase the short-term generation of wastes.

4.6.2 Potential Impacts of the No Action Alternative

If no action is taken to construct the new building, health and safety impacts to personnel working in the Power Plant will continue to exist.

4.7 ENVIRONMENTAL JUSTICE

Activities related to construction and operation of the water treatment building were evaluated to determine if they would disproportionately impact a minority or low-income population, or children. None of the impacts from construction or operation of the proposed Water Treatment Building would be significant, and they would not disproportionately impact a minority or low-income population, or children. No significant environmental justice impacts were identified from the Alternatives.

Measures used for impact analysis include demographic and income data obtained from the U.S. Bureau of Census (2010); these data were used to locate minority populations and low-income populations with the project area.

4.7.1 Potential Impacts of the Proposed Action

The Proposed Action would result in increased emissions of criteria pollutants, noise generated by construction equipment, and the continued use of sulfuric acid and other chemicals. None of these impacts would be significant. The Proposed Action would take place in a sparsely populated area. According to the 2000 U.S. Census, there are only 19 people (other than residents of Cavalier AFS) who live within one mile of the project area. There are no minorities and the percentage of the population below the poverty level within this area is lower than the average for Pembina County and the State of North Dakota. Only four children were identified in this area (a lower percentage than the county and state). Therefore, no disproportionate impacts to minority or low-income populations or children would occur.

4.7.2 Potential Impacts of the No Action Alternative

Under the No Action Alternative, there would be no change to low-income or minority populations, or to children.

4.8 COMPATIBILITY OF THE PROPOSED ACTION WITH OBJECTIVES OF FEDERAL, STATE, AND LOCAL LAND USE PLANS, POLICIES AND CONTROLS

The Proposed Actions would be compatible with the existing federal, state, and local land use plans, policies, and controls. The Proposed Action is compatible with the Air Force's objective to provide a safe environment for chemical storage and use.

4.9 RELATIONSHIPS BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Short-term uses of the environment would include direct construction-related disturbances. The proposed project would not result in an intensification of land use. Development of the proposed project would not result in any loss of open space. The proposed Water Treatment Building would have a long useful life and therefore, long-term productivity.

4.10 CUMULATIVE IMPACTS

Cumulative impacts are those changes to the physical, biological, and socioeconomic environments which would result from the Proposed Action in combination with past, present, and reasonably foreseeable future actions. Significant cumulative impacts could result from impacts that are not significant individually, but when considered together, are collectively significant. Most of the future planned projects at Cavalier AFS are small in scope and would likely occur during different timeframes. Any future federal actions that may have potentially significant cumulative impacts to the environment would be assessed in separate NEPA documents.

Upcoming construction projects at Cavalier AFS include:

- Privatization of 14 housing units
- Construction of a Ground Source Heat Pump
- Construction of an Enlisted Dormitory

Air Quality: It is possible that future construction projects could overlap with construction of the Water Treatment Building and additional short-term cumulative air quality impacts could occur if other construction were taking place outside of the installation boundaries. Other ongoing or scheduled activities would also generate criteria air pollutants (primarily PM₁₀), but the amounts would not be cumulatively significant with the addition of pollutants from the proposed Water Treatment Building. For these reasons, there would be no significant cumulative air quality impacts.

Geology and Soils: Soils at the site are susceptible to short-term wind and water erosion; therefore cumulative construction-related impacts would result in some soil loss. No long-term cumulative impacts to geology and soils would be expected from construction or operation of the Water Treatment Building.

Water Resources: Existing activities in combination with proposed construction projects would not expect to create any significant cumulative impacts to groundwater or surface water.

Biological Resources: Removal of vegetation from past, ongoing, and future projects at the installation would not result in significant cumulative impacts to wildlife since terrestrial and aquatic habitat at the Installation is very limited. Due to the abundance of similar and better quality habitat in the surrounding area little cumulative impact to wildlife is expected from loss of vegetation.

Cultural Resources: Past archaeological surveys on the Installation have not identified any archaeological resources. Present and future activities are proposed for the main built-up portion of the Installation where the probability of finding new archaeological resources is low; therefore, additional cumulative impacts to cultural resources would not be significant. An EA would be prepared for any future projects involving potentially eligible properties on Cavalier AFS.

Hazardous Materials: The potential for overlapping construction projects could have a cumulative impact on the temporary increase of hazardous materials. All construction would be handled in accordance with appropriate Air Force, federal, state and local regulations and no significant cumulative hazardous material impacts are expected.

Environmental Justice: There have been no known past projects that have resulted in environmental justice impacts. Sine Cavalier AFS is in a sparsely populated area and there were no minorities identified within the area, future projects would not be expected to result in cumulative impacts to any minority populations.

4.11 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The irreversible and irretrievable commitment of resources would involve the use of materials, energy, water, and economic resources. Construction of the project would require ordinary materials such as fuel and construction materials. These materials would, except for recyclable items, be irretrievably committed. Long-term commitments of resources would occur from expenditures to complete the construction project. The amounts of resource consumption would be small and comparable to other defense-related projects. Long-term commitment of resources would occur from operation and maintenance of the building. The amounts of resource consumption are not expected to increase significantly from current usage.

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APPENDIX A

DD FORM 1391

This section includes a copy of the DD Form 1391 for the project.

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1. COMPONENT AFSPC		FY 2007 CONSTRUCTION PROJECT DATA		2. DATE 15 February 2006	
3. INSTALLATION AND LOCATION Cavalier Air Force Station, North Dakota			4. PROJECT TITLE Construct Industrial Water Treatment Building		
5. PROGRAM ELEMENT 31476 EE-C 529	6. CATEGORY CODE 842245	7. PROJECT NUMBER 80YN 56-32643A	8. PROJECT COST (\$000) \$175K		
9. COST ESTIMATES					
ITEM	UOM	QUANTITY	UNIT COST	COST (\$000)	
Site work	LS	1		\$2.28	
Structure/Architectural	LS	1		\$34.43	
Mechanical	LS	1		\$46.57	
Electrical	LS	1		\$15.91	
Desk	LS	1		\$0.55	
SUBTOTAL				\$119.74	
Special security requirements (5% Post 911)				\$5.99	
Overhead and Profit (26.5%)				\$33.32	
Contingency (10%)				\$15.90	
Total Request				\$174.95	
Unfunded Costs					
Design (10%)				\$17.5	
10. DESCRIPTION OF PROPOSED WORK Design and construct a chemical treatment building to service cooling water and descale cooling tower louvers. Floor must be built to contain tank contents with 6" freeboard. Treated concrete to resist acid and bases, potable water, electricity, fire protection/detection, heat, shower, eyewash, acid piping to cooling towers and secondary containment must be provided. Metal construction 20' by 30' and insulated with one man door to the south. Acid tank, controls, monitoring and pump(s) are to be provided. All IAW applicable AFI's, codes and security requirements.					
11. REQUIREMENT:					
PROJECT: Design and construct a chemical treatment building to service cooling water and descale cooling tower louvers.					
REQUIREMENT: The addition of this building will reduce the environmental and safety hazards of acid in the PA&T Power Plant building. This building will provide a safe environment for the chemical storage and use. The purpose of moving the water treatment storage outside is to separate the hazardous chemicals from the people. Although bulk storage of sulfuric acid appears to be an undesirable situation, it reduces the requirement for people to download totes of material. Except when material is being delivered or occasional routine maintenance, the facility (building) would be largely unoccupied. We should endeavor to keep it that way as often as possible.					
CURRENT SITUATION: F-M Impact Rating: MS/DEG The acid, corrosion inhibitors, and hookdes are used and stored in building 820, Power Plant. There are risks involved with the transport and usage of these chemicals.					

DD FORM 1391, DEC 76

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APPENDIX B

Notice of Availability

This section includes a copy of the Notice of Availability that was published in the Cavalier Chronicle newspaper on June 9, 2010.

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STATE OF NORTH DAKOTA,)
 County of Pembina) ss.
 Timothy J. Schroeder, being first duly sworn, on his/her
 oath deposes and says; that THE CAVALIER CHRONICLE is a weekly
 newspaper of general circulation printed and published in the City of Cavalier,
 County of Pembina and State of North Dakota, by Chronicle Publishing Co., that
 it has complied with all requirements of the laws of the State of North Dakota
 concerning legal publications, is now, and during all the times hereinafter
 mentioned has been a legal newspaper; that deponent is the President
 of said Cavalier Chronicle in charge of the advertising and the advertisement of
Notice of Availability,
 a printed copy of which is hereto annexed, was printed and published in every copy
 of each issue of said Cavalier Chronicle for a period of one consecutive
 weeks, to-wit:
June 9, 20 10 37 1@ \$.68, 20 _____
 _____, 20 _____, 20 _____
 _____, 20 _____, 20 _____

Timothy J. Schroeder

Subscribed and sworn to before me this 9 day
 of June, A.D., 20 10

DELORES M. KEMP
 Notary Public

NOTICE OF AVAILABILITY
 DRAFT FINAL ENVIRONMENTAL
 ASSESSMENT (EA)
 AND FINDING OF NO SIGNIFICANT
 IMPACT (FONSI)
 CONSTRUCTION AND OPERATION
 OF WATER TREATMENT BUILDING
 CAVALIER AIR FORCE STATION,
 NORTH DAKOTA

An EA has been prepared in accordance with the National Environmental Policy Act of 1969 and the Council on Environmental Quality implementing NEPA to analyze the potential environmental consequences of constructing and operating a Water Treatment Building at Cavalier AFS. The EA analyzes potential impacts from construction of the facility to air quality, geological resources, water resources, biological resources, cultural resources, environmental justice, and hazardous materials. The Draft Final EA and FONSI, dated June 2010, are available for review at the library listed below and on the web at www.bochtal-s.com/public.

Cavalier Public Library
 106a W 2nd Ave South
 Cavalier, ND 58220
 (701) 285-4746

Public comments on the EA will be accepted through July 9, 2010. Written comments and inquiries on the EA should be directed to Ms. Dawn Hamrick, 10 SWS/EV, 630 Patrol Road #260, Cavalier AFS, ND 58220 or email: dawn.hamrick.ctr@cavalier.af.mil.
 (June 9, 2010)

Publication Fees.....\$ 25.16

Affidavit.....\$

Total.....\$ 25.16

Affadavit

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